

Centennial West Clean Line

July 2012

CLEAN LINE

ENERGY PARTNERS

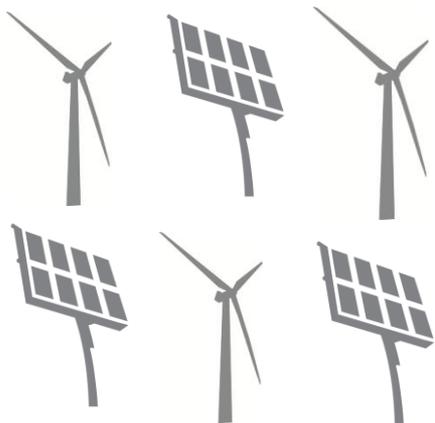


Introduction to Clean Line Energy

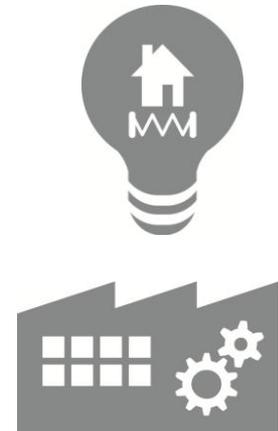
Connecting Renewable Energy to Demand

- Clean Line is an independent developer solely focused on building transmission lines.
- Clean Line is backed by investors with a long-term outlook and patient capital.
- Clean Line's management team brings a track record of success in energy project development.

Strong wind and solar resources



Large demand centers

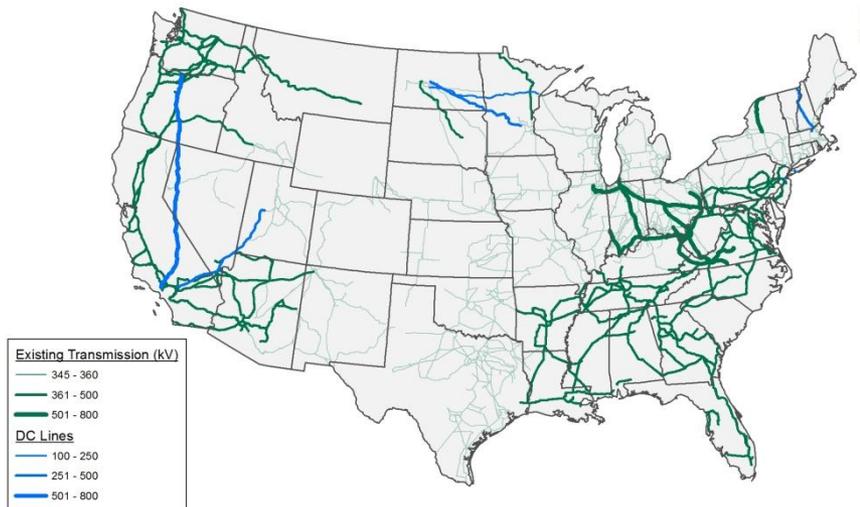
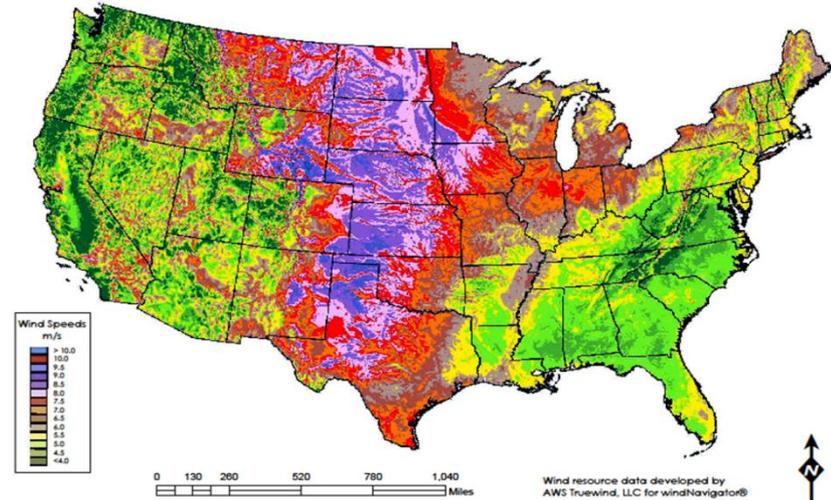


HV→DC

Integrating large clean energy sources with demand centers

Why do we need transmission?

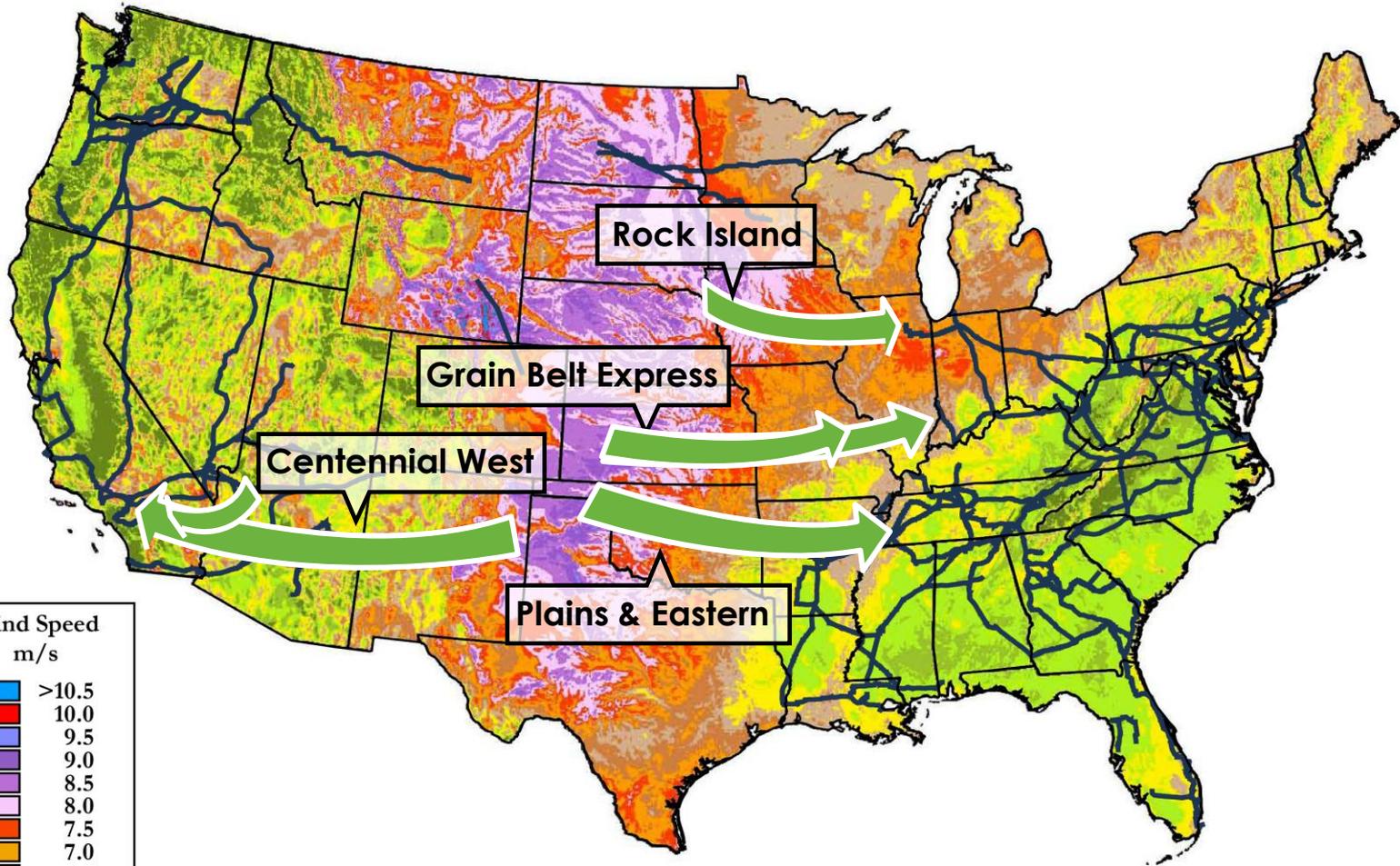
Best wind resources are in the central spine of the United States away from distant population centers



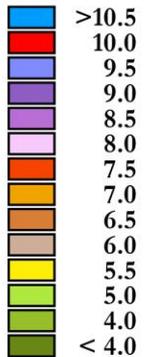
...and with limited access to robust transmission systems



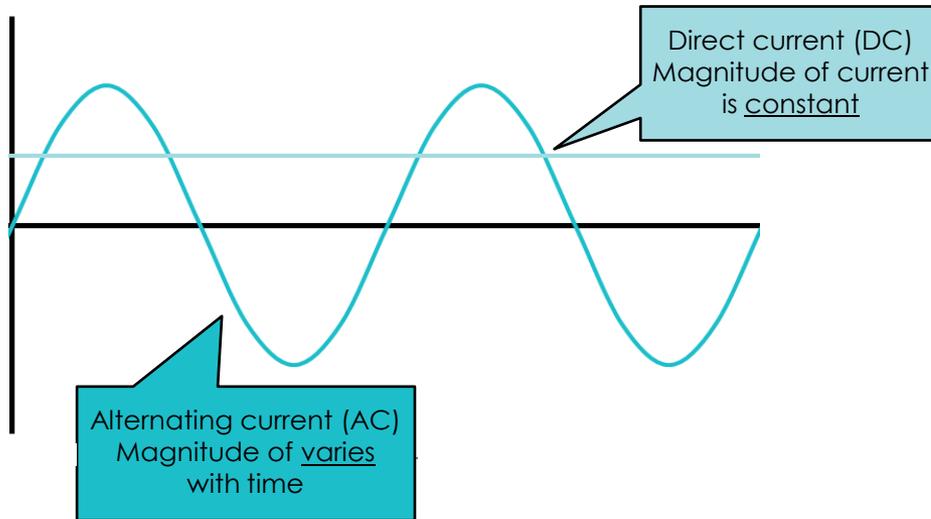
Clean Line's four projects can bring 17+ GW of wind power to market



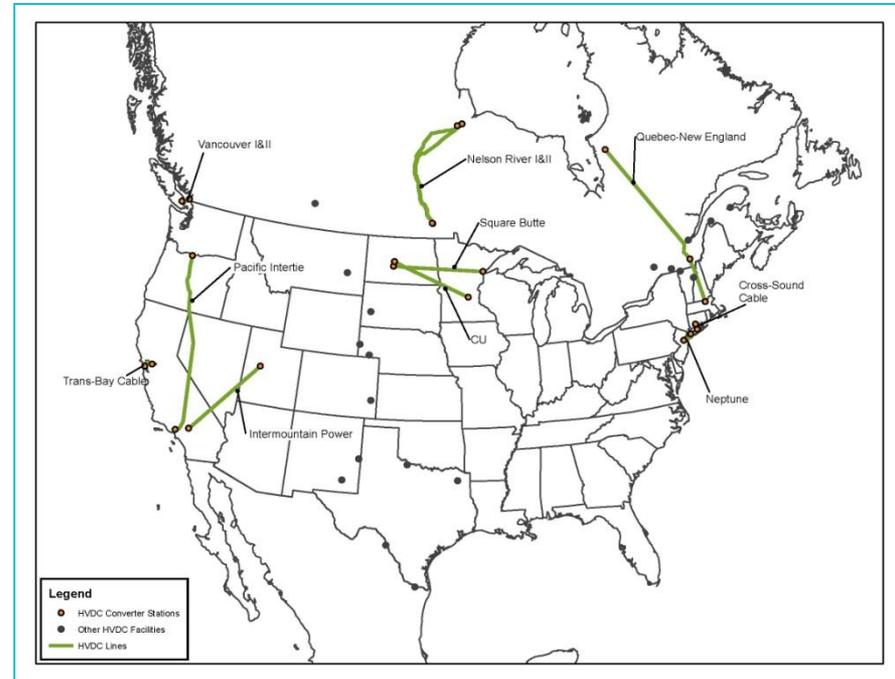
Wind Speed
m/s



What is Direct Current (DC?)



- Has been around since Edison and Westinghouse
 - Power line to your house - AC
 - Car batteries - DC
 - AC easier to change voltage
- Proven technology
 - 6 HVDC overhead lines in US
 - Hundreds more around the world
- Can be an effective complement to the AC system

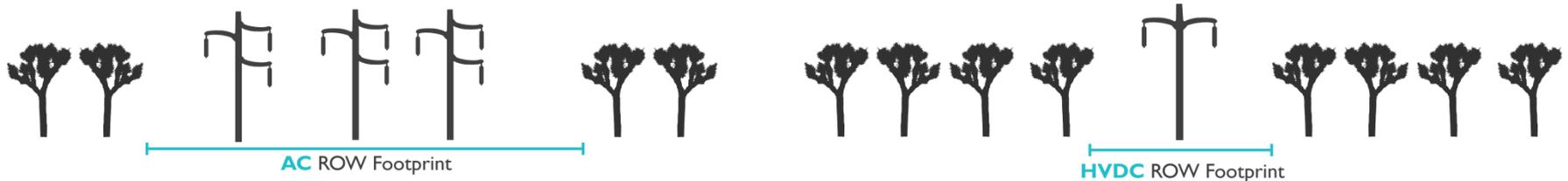


- Conversion at high voltage is expensive so DC only makes sense for specific applications
 - Take a large amount of generation a long way (typically more than 400 miles)
 - Underwater and underground cables
 - Asynchronous interconnections

HVDC is the most efficient method to transmit large amounts of electricity over long distances

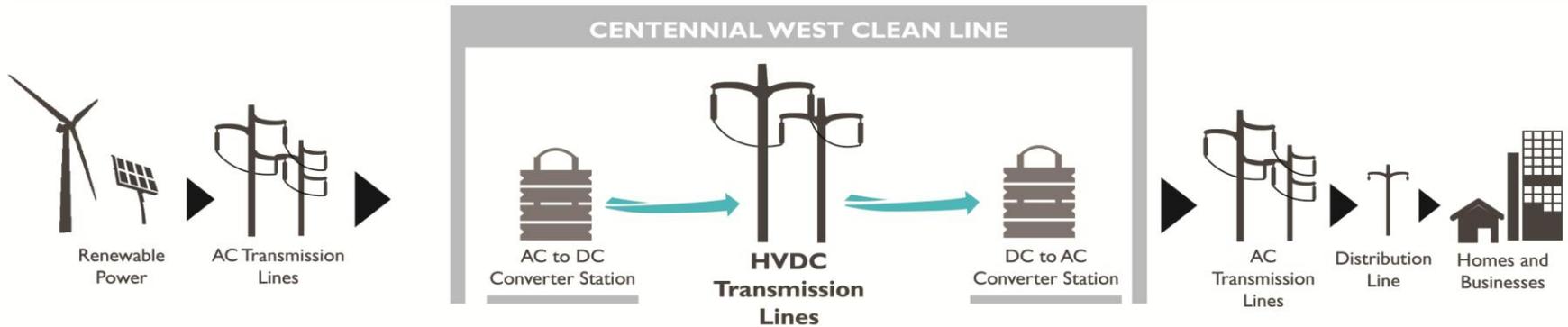
- More efficient — Lower line losses
- Lower cost — Requires less infrastructure, lower costs and lower prices for delivered renewable energy
- Improved reliability — Control of power flow, enhances system stability, and lower costs of integrating wind
- Smaller footprint — Use narrower right-of-way than equivalent Alternating Current (AC)

RIGHT-OF-WAY (ROW) FOOTPRINT



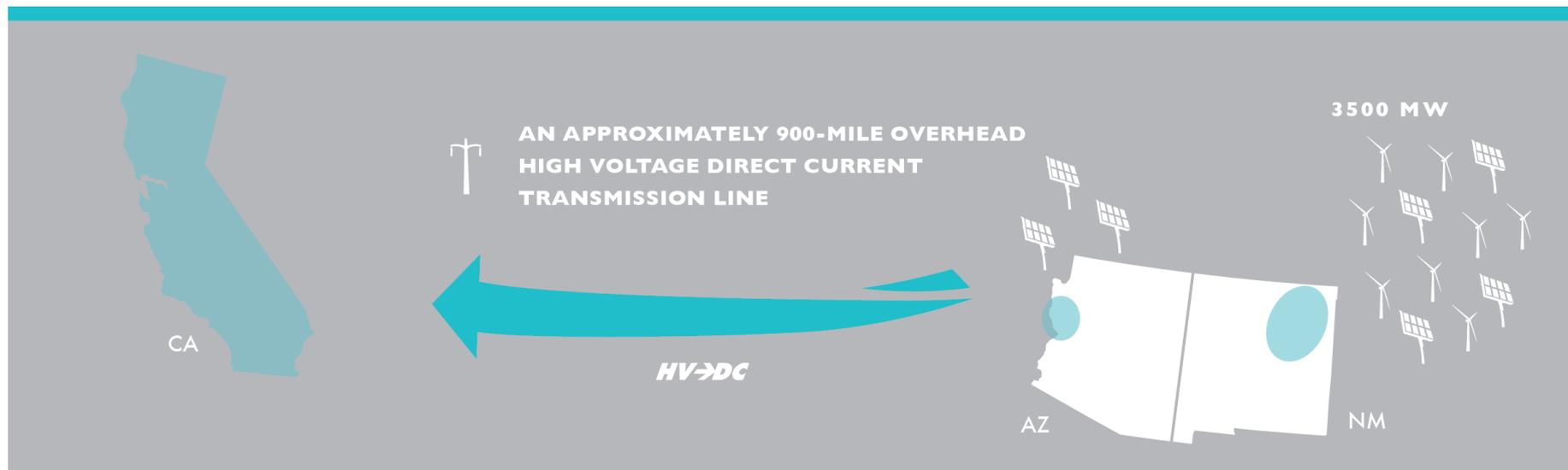
HVDC delivery of renewable energy would augment the existing grid

DELIVERING RENEWABLE ENERGY WITH HVDC



Typical converter station and switchyard

Centennial West Clean Line will transmit 3500 MW of renewable power to California

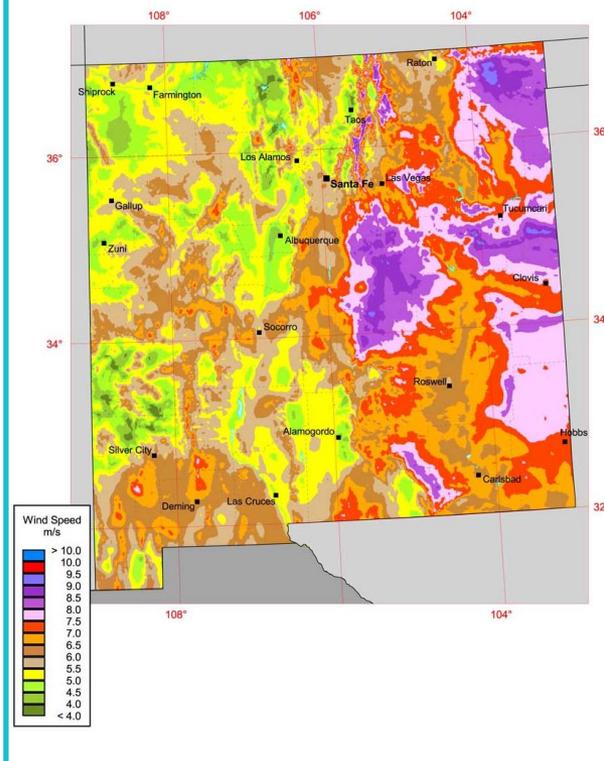


Project Specifications

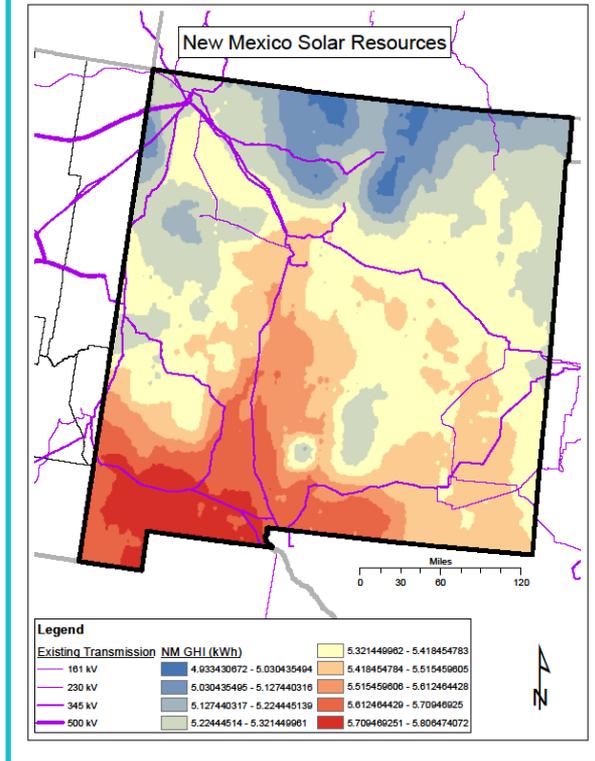
Transmission Capacity	3,500 MW
Technical Configuration	±600 kV DC bipole transmission line
Approximate Length	900 miles
Target Utilization Rate	50+%
Approximate Capital Cost	\$2.5 billion

Centennial West will use exceptional Southwest renewable resources

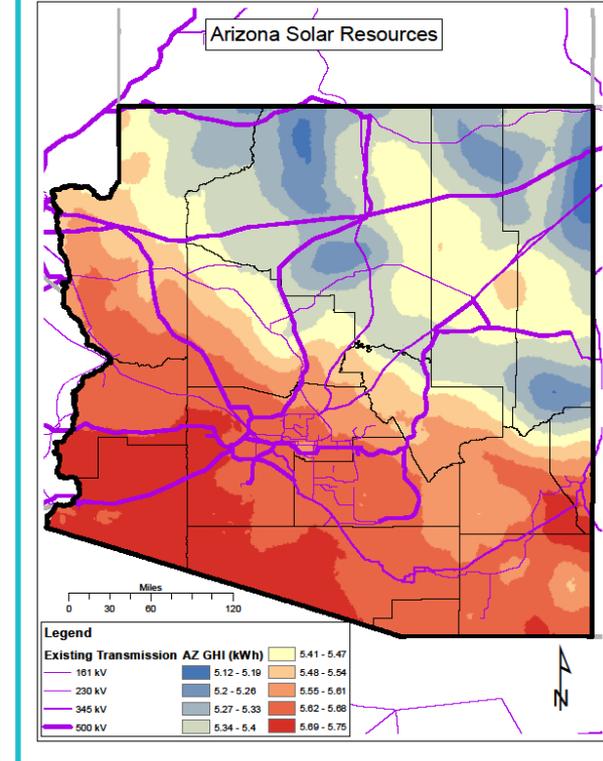
New Mexico Wind



New Mexico Solar



Arizona Solar



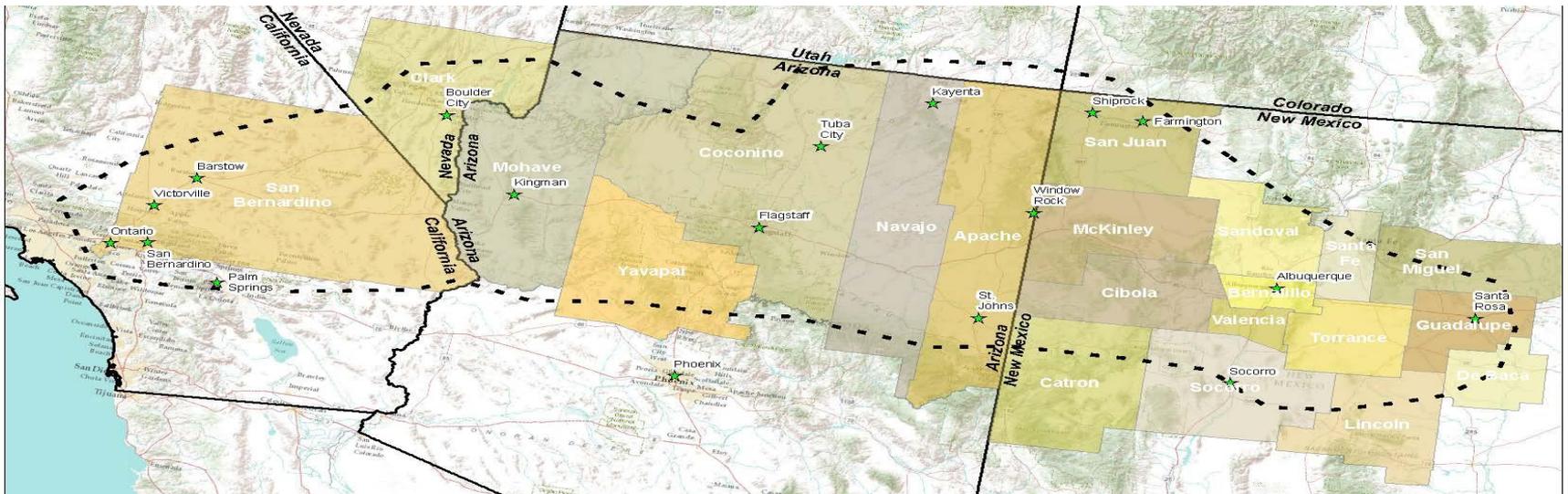
Source: AWS Truewind, NREL

Centennial West is conducting extensive public outreach



- Held 18 community leader workshops in four states and two tribal nations to gather information about local routing opportunities and constraints. Over 150 local leaders attended.
- Working with landowners to provide information and minimize impacts
- Continuing to meet with and seek input from State and Federal regulators, environmental groups, elected officials, and potential suppliers

Community Leader Workshops



Routing and permitting process is proceeding carefully and methodically

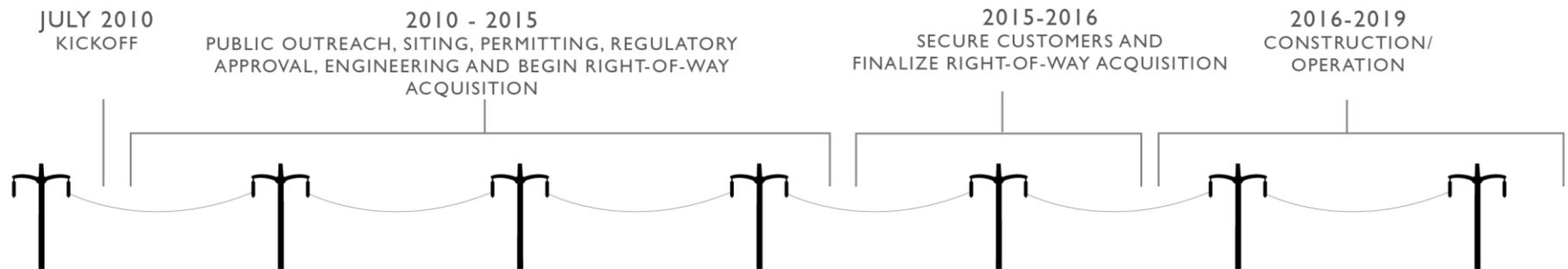
- Signed Advance Funding Agreement for Development with Western Area Power Administration
- Submitted Right-Of-Way Application (SF-299) and Preliminary Plan of Development to Bureau of Land Management and to the U.S. Forest Service
- Conducting NEPA coordination with national BLM and USFS project manager
- Signed MOU with New Mexico Renewable Energy Transmission Agency and cooperating on efforts to site line in New Mexico
- NEPA public scoping meetings anticipated in 2013

Interconnection and engineering options are undergoing systematic analysis

- Working with environmental groups and regional transmission planning efforts like the WECC Environmental Data Task Force to receive information on sensitive areas
- Completed feasibility study with PNM on HVDC and VSC options
- Participating in Western Electricity Coordinating Council stakeholder meetings
 - Studied in WECC 10 and 20 year plans
- WECC Path rating process is underway
 - Project Review Coordination Group Report completed
- CAISO interconnection request filing in March 2013
 - Working with CAISO staff to address gaps in interconnection process for external transmission lines

Centennial West plans to achieve commercial operation in early 2019

CENTENNIAL WEST CLEAN LINE SCHEDULE



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www.centennialwestcleanline.com



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